

New or noteworthy Compositæ from Guatemala.

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Mr. John Donnell Smith has placed in my hands for determination his recent and large collections of Compositæ from Guatemala. From the long and interesting list of species that these collections contain, the following have been selected for publication as being new or especially noteworthy. In the final and critical study of species the herbarium and library of Harvard University were used, and thanks are due to Dr. Sereno Watson for his courtesy in supplying every facility for such study. Mr. Henry E. Seaton, my assistant, made all the dissections and rendered valuable service in generic determinations.

VERNONIA TRIFLOSCULOSA HBK.—Published descriptions say that the leaves are "very entire," but specimens from San Luis, Depart. Escuintla (*J. D. S.* 2377), show that the larger leaves are apt to have some callous serrulations.

VERNONIA LEIOCARPA DC.—Abundant and very fine material from Pacaya, Depart. Amatitlan (*J. D. S.* 2405), show that the heads are at first cylindrical, becoming "ovate" only with ripening and spreading, and that they are mostly 3-(sometimes 4)flowered, rather than "5-flowered."

VERNONIA SALVINÆ Hemsl., var. *canescens*, n. var.—Leaves white beneath with a dense pannose tomentum.—Coban, Depart. Alta Verapaz, March, 1881 (*Türckheim* 583).

STEVIA COMPACTA Benth.—Specimens from Volcan de Agua (*J. D. S.* 2327) show that the under surface of the leaves is apt to be more or less woolly, and that the branches and inflorescence may have more or less floccose wool.

Eupatorium Donnell-Smithii n. sp.—Usually tall and rather stout perennial herb, hirsutely pubescent especially above and in the inflorescence (the spreading hairs of the stem somewhat glandular and viscid), often glabrate below, leafy up to and in the inflorescence: leaves opposite, broadly ovate, crenate-serrate, acute or acuminate, more or less pubescent or even hirsute especially beneath and on the prominent veins, 4 to 10 cm. long, 2.5 to 6.5 cm. broad, the lower long-petioled,

the uppermost short-petioled: heads 4 to 7 mm. high, numerous in a usually broad and ample leafy panicle, with white flowers: involucre bracts narrowly oblong, acute or acuminate, in about two nearly equal rows, thickened and conspicuously striate-nerved below, thinner and sometimes almost scarious at tip (especially the inner ones, which are also more decidedly acuminate or even mucronate-tipped), the outer ones more or less hirsute (often densely so), the inner ones glabrous or chiefly pubescent at tip: heads 40 to 50-flowered, with a flat or slightly convex receptacle and corolla-lobes bearded externally: achenes pubescent on the ribs, with scanty and barbelate pappus.—Aceituna, Depart. Guatemala, alt. 4600 ft., Feb. 1889 (*J. D. S.* 2374); Coban, Depart. Alta Verapaz, alt. 4300 ft., April, 1889 (*J. D. S.* 1603); Sarnac, Depart. Alta Verapaz, alt. 4600 ft., April, 1889 (*J. D. S.* 1602); Volcan de Agua, Depart. Zacatepequez, alt. 9500 ft., April, 1890 (*J. D. S.* 2329); Guatemala, Depart. Guatemala, alt. 5000 ft., Feb., 1890 (*J. D. S.* 2365).—This species seems closely related to *E. ciliatum* Less., to which it was referred by Hemsley (*Bourgeau* 1927) and John Donnell Smith (*Türckheim* 407, in 1887); but *E. ciliatum* has 18 to 22 flowers in a head and a glabrous corolla, while *E. Donnell-Smithii* has 40 to 50 flowers in a head and a bearded corolla.

Var. **parvifolium** n. var.—Much smoother, with smaller leaves, and but 20 to 35 flowers in a head.—Dueñas, Depart. Zacatepequez, alt. 5000 ft., April, 1890 (*J. D. S.* 2333).

EUPATORIUM AZUREUM DC.?—Apparently a form of this species was collected on Volcan de Agua, Depart. Zacatepequez, alt. 9000 ft., April, 1890 (*J. D. S.* 2326), in which the heads are but 12 to 16-flowered.

Eupatorium lyratum n. sp.—A stout apparently low branching perennial herb, softly pubescent throughout (the stem often even hirsute and more or less glandular): leaves alternate, the lower ones obovate, lyrate-pinnatifid and petioled, 5 to 9 cm. long, 2.5 to 4 cm. wide, gradually becoming less lyrate, irregularly toothed, sessile and even auriculate-clasping above, the uppermost ones (in the inflorescence) merely ovate (acute) and slightly toothed or entire: heads about 6 mm. high, rather few in a very loose irregular leafy panicle, with white flowers: involucre bracts linear-lanceolate to linear, acuminate, very lax in 3 or more unequal rows (some of them exceeding the head), the inner ones linear

and somewhat scarious, all more or less pubescent (the inner ones chiefly so at the tips), the outer ones often very much so (even hirsute) and more or less glandular: heads many-flowered, with a flat receptacle, and very long and slender corolla-tubes with very minute lobes (if any): achenes pubescent, with scanty but long and conspicuous, very minutely barbed soft white pappus.—Laguna Amatitlan, Depart. Amatitlan, alt. 3900 ft., March, 1890 (*J. D. S.* 2393). A species remarkable in its leaf characters and very long and slender corolla tube.

Eupatorium Rafaelense n. sp.—A small shrub, glabrous or minutely pubescent: leaves opposite, rather long petioled, ovate to lance-ovate, acute or acuminate, from crenate-serrate to minutely so or even entire, 3 to 7.5 cm. long, 2.5 to 3.5 cm. wide (but the numerous specimens show only the leaves of the branchlets): heads 9 to 18 mm. high, in loose or rather compact cymose clusters, terminating opposite divergent branchlets, the clusters becoming more compacted into a thyrsoïd inflorescence above: involucrel bracts linear-oblong, often purplish, acute or obtuse, in about 3 unequal lax rows, about half as long as the head, striate-nerved below, more or less pubescent and glandular (especially the outer ones), all with ciliate margins: heads 35 to 45-flowered, with a flattish or slightly convex receptacle and glabrous corolla: achenes scabrous-puberulent on the ribs, with conspicuous and barbellate white pappus.—San Rafael, Depart. Zacatepequez, alt. 6500 feet, April, 1890 (*J. D. S.* 2331); Guatemala, Depart. Guatemala, alt. 5000 feet, Feb., 1890 (*J. D. S.* 2368).

EUPATORIUM POPULIFOLIUM HBK.—This species seems to be very variable in the size of its leaves and flower clusters. Specimens from Laguna Amatitlan (*J. D. S.* 2400) are reed-like in habit, becoming 18 feet high, with leaves a foot or more long, compact thyrsoïd panicles over a foot long and broad, and uniformly 11-flowered heads. Specimens from Cuyuta, Depart. Escuintla (*J. D. S.* 2399), are 12 feet high, with leaves not half as large, flower clusters only 5 or 6 inches long and 3 or 4 broad, and uniformly 9-flowered heads.

EUPATORIUM TUERCKHEIMII Klatt.—Specimens from Pan-samála (*Türckheim* 1342) show broader leaves than the type. They are ovate and long-acuminate, often nearly 2 inches broad.

EUPATORIUM AGERATIFOLIUM DC., var. **purpureum** nov. var.—Inflorescence with a dense purple glandular pubescence and the involucre bracts purple.—Coban, Depart. Alta Verapaz, alt. 4600 feet, May, 1887 (*Türckheim* 52).

Brickellia Pacayensis n. sp.—Closely related to *B. Hartwegi* (*Eupatorium rigidum* Benth. Pl. Hartw. 88) but the whole upper part of the plant is blackened with stipitate glands, the heads are 20 to 30-flowered, and the involucre scales are often much narrowed (linear-lanceolate to linear), longer, and more decidedly acuminate: the pappus is minutely but densely serrulate and the achenes densely soft pubescent. — Pacaya, Depart. Amatitlan, alt. 6000 feet, March, 1890 (*J. D. S.* 2389).

APLOPAPPUS STOLONIFERUS DC., var. **glabratus** nov. var.—Leaves glabrate, not all ‘‘very hirsute’’ as in the type. — A curious and handsome *Aplopappus* found on the crater of Volcan de Agua, Depart. Zacatepequez, alt. 12100 feet, April, 1890 (*J. D. S.* 2328).

Aphanostephus Pinulensis n. sp.—A stout very leafy and branching perennial 3 to 4.5 dm. high, rather glaucous and softly pubescent, the young leaves and branches and inflorescence more or less floccose: leaves punctate, lance-ovate to obovate in outline, the lower (blade) 9 cm. long, and on long petioles, gradually becoming smaller upwards, bipinnatifid, the oblong obtuse pinnæ more or less confluent and irregularly pinnately cleft and toothed (the whole plant with its conspicuous heads having an *Achillea* look): heads on short peduncles collected in a terminal corymbose cluster: bracts of the involucre lanceolate and strongly carinate: rays 5 to 8 mm. long, white, mostly reflexed with age: base of the corolla-tube in age prominently thickened and indurated, more or less persistent on the strongly angulate-costate whitish achene: pappus a very short crown with toothed edge. — Pinula, Depart. Guatemala, alt. 4400 feet, Feb., 1890 (*J. D. S.* 2407). A remarkable looking *Aphanostephus* on account of its broad bipinnatifid leaves.

Clibadium Donnell-Smithii n. sp.—Stem and inflorescence hirsute: leaves broadly ovate, mostly long-acuminate, with spinulose-crenulate serrulations, velvety pubescent beneath (even hirsute on the veins), scabrous above, 12 to 25 cm. long, 6 to 16 cm. broad, on long petioles: heads 4 to 5 mm. high,

in a rather small open cymose panicle: involucre bracts ovate, acute or cuspidate, ciliate on the margins, sparingly so on the back: corolla-lobes of sterile flowers with scanty pubescence if any: achenes obovate, conspicuously pilose at apex. — Guatemala, Depart. Guatemala, alt. 5000 feet, Feb., 1890 (F. D. S. 2347). This species is near *C. Surinamense* L., var. *asperum* Baker, but it differs in its comparatively smooth corolla-lobes of the sterile flowers, and strikingly in its large broad leaves, velvety pubescent beneath, and long petioles. From *C. arboreum* Donnell Smith it differs in its involucre bracts, leaves, and villous achenes.

MONTANOVA OVALIFOLIA DC. is worthy of mention as being a plant reported before only from Bogota. These specimens are from Pacaya, Depart. Amatitlan, alt. 6000 feet, March, 1890 (F. D. S. 2352).

Tetragonotheca Guatemalensis n. sp. — Apparently closely allied to *T. Texana* Gray and Engelm.; but the leaves are deltoid, with mucronate serrulations and usually one or two prominent basal teeth, abruptly decurrent into a winged petiole which does not enlarge or clasp at base; leaves of the inflorescence ovate-lanceolate to lanceolate, acuminate, tapering gradually to a petiole: corolla-tubes, both of the ray and disk-flowers, very long and slender, more or less glandular pubescent, as is the whole inflorescence: pappus none in our specimens. — Senahú, Depart. Alta Verapaz, alt. 3500 feet, April, 1889 (F. D. S. 1592). A remarkable *Tetragonotheca* on account of its long and slender corolla tubes, the showy yellow ligules looking conspicuously slender-clawed.

Zexmenia Dulcis n. sp. — Pubescent and branching: leaves thickish, opposite, short-petioled, ovate or oblong, acute, distantly mucronate-serrate, scabrous on both sides but very much more so above, 6 to 9 cm. long, 3.5 to 5 cm. broad: heads on rather long peduncles (2.5 to 5 cm.), about 10 mm. high: involucre bracts lanceolate to ovate, mostly acute, scabrous with rough hairs: bracts of the receptacle winged on the back, with a sharply acute or acuminate minutely toothed apex: achenes of the ray 3-angled and 3-awned; those of the disk broadly winged, with usually two prominent unequal awns and numerous small squamellæ. — Rio Dulce, Depart. Livingston, alt. 0 feet, March, 1889 (F. D. S. 1607). Resembling *Z. scandens* Hemsl. somewhat, but differs from that species in its acute leaves, long-peduncled and smaller heads,

acute involucre bracts, merely 3-angled ray achenes, and broadly-winged disk achenes. Much more nearly related to *Z. trachylepis* Hemsl., but differs in its longer-pedunculate heads, acute involucre bracts, very acute or acuminate ('rounded at apex' in *Z. trachylepis*) chaff and unequal awns.

TITHONIA TUBÆFORMIS Lass.—Specimens collected at Pacaya, Depart. Amatitlan (F. D. S. 2390), show a peculiar habit. All the specimens in the Gray Herbarium are tall branching plants, while many of these are low and widely divaricate-branched at the very base.

MELANTHERA HASTATA Rich.—It is evident that this species must include *M. oxylepsis* DC., as in specimens from Pinula and Rio Amatitlan (F. D. S. 2342 and 2341) there are all gradations in the leaves from ovate-deltoid (*M. oxylepsis*) to hastately 3-lobed (*M. hastata*).

ENCELIA MEXICANA Mart.—This variable species was collected at Laguna Amatitlan (F. D. S. 2408), and in comparing it with specimens in the Gray Herbarium it seems evident enough that it should be considered to include *E. subaristata* Gray, *E. heterophylla* Hemsl., *E. fætida* Hemsl., and *E. cordata* Hemsl., as indicated by Dr. Gray in an herbarium note.

SPILANTHES REPENS Michx. has been heretofore reported only from the southern United States. It now comes from Coban, Depart. Alta Verapaz, alt. 4300 feet (F. D. S. 1614).

SPILANTHES BECCABUNGA DC.—Specimens from Dueñas, Depart. Zacatepequez, alt. 5000 feet (F. D. S. 2125) show that the achenes are often pubescent.

BIDENS HETEROSPERMA Gray.—Specimens from Guatemala, Depart. Guatemala, alt. 5000 feet (F. D. S. 2351), show that the achenes are not always glabrous.

Bidens Antiguensis n. sp.—§ **PSILOCARPÆA**. Closely resembling *B. leucantha* Willd. but the rays (mostly present) narrowly oblong, acute, bright yellow (8 to 12 mm. long), and the 2 (rarely 3) rigid awns perfectly smooth and widely divaricate: exceedingly variable in pubescence, from glabrous to pilose-pubescent.—Antigua, Depart. Zacatepequez, alt. 5000 feet, April, 1890 (F. D. S. 2354); San Luis, Depart. Escuintla, March, 1890 (F. D. S. 2375).

Senecio Donnell-Smithii n. sp.—A very stout woolly-pubescent perennial: leaves alternate, thick, very broadly ovate to rotund in outline, cordate at base, undulately lobed and margined with blackish mucronulations, glabrous above,

densely whitish woolly beneath, 9 to 15 cm. long, 8 to 11 cm. broad, on stout petioles: heads 8 to 10 mm. high, in a large terminal very compact panicle: involucral bracts lanceolate, hirsute and purple-tipped: ray-flowers 6 to 8, with narrowly oblong yellow ligules 4 to 6 mm. long; disk-flowers 12 to 16. ✓ Volcan de Agua, Depart. Zacatepequez, alt. 11000 feet, April, 1890 (J. D. S. 2362). Near *S. Aschenbornianus* Schauer, but differs in being stouter, with much more compact inflorescence, leaves very smooth above and densely woolly beneath, hirsute purple-tipped involucral scales, and more numerous disk-flowers. A very striking and handsome species.

SENECIO GHIESBREGHTII Hort. Hal. Regel (*S. grandifolius* of authors, not Less.)—Specimens from Serranquitché, Depart. Alta Verapaz, alt. 2500 feet, (J. D. S. 1598), show that the characters of the species must be made to include not only ovate, but also elongated ovate or even obovate leaves, which are often acute at base as well as apex, and whose margins vary from sinuate-dentate to entire. These Guatemalan specimens also show that the disk-flowers may be fewer than 10, most of the heads containing but 5 or 6.

SENECIO GHIESBREGHTII Hort. Hal. Regel, var. **pauciflorus** n. var.—Differs from the species in having fewer-flowered heads and hairy involucral bracts.—Sapote, Depart. Guatemala, alt. 4300 feet, March, 1890 (J. D. S. 2359); Chucaneb, Depart. Alta Verapaz, alt. 6000 feet, April, 1889 (J. D. S. 1606). *S. Ghiesbreghtii* has 4 to 6 ray-flowers and 10 disk-flowers; while the variety has uniformly 2 ray-flowers and 3 disk-flowers.

Senecio Cobanensis n. sp.—A woody-stemmed glabrous and very leafy plant: leaves scattered, thickish, elongated, narrowly lanceolate to oblanceolate and acuminate, on slender petioles, usually with distant serrulations, 10 to 14 cm. long, 2 to 2.5 cm. broad, readily falling off and leaving the stem covered with prominent scars: heads discoid, about 6 mm. high, in terminal rather loose corymbose panicles: involucral bracts about as long as the head, linear-oblong, obtuse or acutish, thick and rigid, keeled and somewhat saccate below (forming a truncate base to the head), often with very small accessory bractlets: disk-corollas about 6, deeply 5-lobed, the lobes usually with inflexed tips: achenes glabrous. ✓ Coban, Depart. Alta Verapaz, alt. 4300 feet, May, 1887

(*Türckheim* 1158). A species perhaps nearest to *S. Candelariae* Benth., but very distinct.

PEREZIA NUDICAULIS Gray.—Specimens from Guatemala, Depart. Guatemala (*J. D. S.* 2364) show that the leaves are not “all runcinate,” some of them being simply ovate.

SENECIO KERMESINUS Hemsl. (*Gynoxys Hænkei* DC.)—Abundant material from Guatemala, Depart. Guatemala, alt. 5000 feet (*J. D. S.* 2356), shows that the original description of De Candolle needs emendation, as that was professedly drawn from imperfect specimens showing only the upper leaves. The lower leaves are coriaceous, rugose veiny, and more or less coarsely toothed. The heads also frequently have more numerous flowers. The plant is a very handsome one, climbing high over trees.

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Notes on North American Willows. VI.

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A review of the willows of California.

More than ten years have elapsed since the publication of the second volume of the Flora of California. I wish to look over the account given therein of the willows, make some comments in the light of a better information, and correct mistakes.

1.¹ SALIX NIGRA Marsh.—This species, in its distribution from Texas southward and westward, presents two diverging lines of variation. Southward, along the Gulf coast, it passes by insensible gradations into the Mexican form of *S. Humboldtiana*. Westward, across the plains of New Mexico and Arizona, it takes on the character of var. *venulosa* Anders. with the lower leaves of the branches oblong, rather obtuse, often mucronate, later leaves at the tips of the branches attenuate-linear, all yellowish-green (at least in herbarium specimens) and veiny; mature capsules yellowish and long pediceled. Var. *Wrightii* And. is the same thing only representing (as it appears to me) an abnormal or retarded

¹The numbers correspond with those of the Flora of California.